



SUBCONTRACT MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 OVERVIEW

This Subcontract Management Plan identifies the procedures and processes FlightSafety Services Corporation (FlightSafety) will use to select and manage subcontractors for the TSA II contract. FlightSafety has subcontracted many efforts for USAF Aircrew Training System production, modification, and support. These experiences have resulted in the evolution of an effective process for ensuring the successful completion of subcontracted products and effort. The procedures and processes identified in this plan, together with the provisions of FlightSafety's Contract Administration Subcontracting Policy and FlightSafety's Subcontracting Manual, will be used for all subcontracted ATS products, modifications, and/or technical support efforts.

1.2 REFERENCE DOCUMENTS

- FlightSafety's Contract Administration Subcontracting Policy, Rev 1, dated 15 Oct 2000
- FlightSafety's Subcontracting Manual Rev 1 dated 15 Oct 2000
- FlightSafety's System Design and Technical Support (SDTS) Estimating Standard Operating Process and Procedures (SOPP), Technical Evaluation of Proposals, Rev 001 dated Nov 30, 2000
- FlightSafety's Contract Administration Subcontracting Policy, Rev1, dated 15 Oct 2000
- FlightSafety's Quality Assurance Manual (QAM-1000), procedure number Q-1710

2.0 SUBCONTRACT MANAGEMENT PROCESSES

2.1 INTEGRATED PRODUCT TEAMS

FlightSafety's subcontract management process will include the use of an Integrated Product Team (IPT) for each major subcontract. The IPT will include appropriate representatives from the subcontractor, FlightSafety, and the Government. Representatives may include Contracts, Program/Project Management, Technical (i.e., Engineering), User (e.g., Instructor), Logistics, and Quality Assurance personnel. The objective of the IPT will be to ensure complete understanding of the functional, quality, support, and schedule requirements of the product being subcontracted. The

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Subcontract IPT will be co-chaired by the FlightSafety and subcontractor Project Managers. The IPT concept will facilitate the two key elements to a successful subcontracted project: Visibility and Communications.

Visibility: FlightSafety will require a System Requirements Review, a Preliminary Design Review, and a Critical Design Review on all product and modification subcontracts. These reviews will be accomplished in the traditional IPT environment. In addition to these on-site reviews (either in-plant or at the prototype site), FlightSafety will schedule in-plant in-process reviews for critical or complex subcontracts such that FlightSafety will visit the subcontractor's facility approximately once each month. FlightSafety will also require a detailed schedule at the beginning of the project and a monthly progress report that identifies significant progress, anticipated events, problems encountered, and schedule status, including recovery plans for any elements behind schedule.

Communications: Because the reviews are IPT events, key players will be present and communications will be accurate and thorough. Additionally, FlightSafety's Project Manager and/or System Engineer will be in frequent telephone contact with subcontractor and Air Force personnel. Telephone contact with the subcontractor technical personnel will typically take place at least once every week. Technical questions from the subcontractor will be given top priority because project schedules usually are at risk if technical questions are not answered quickly, or if they are answered incorrectly.

Figure 2.1-1, illustrated on the following page, depicts the organizational chart for the key players in subcontract management within FlightSafety.

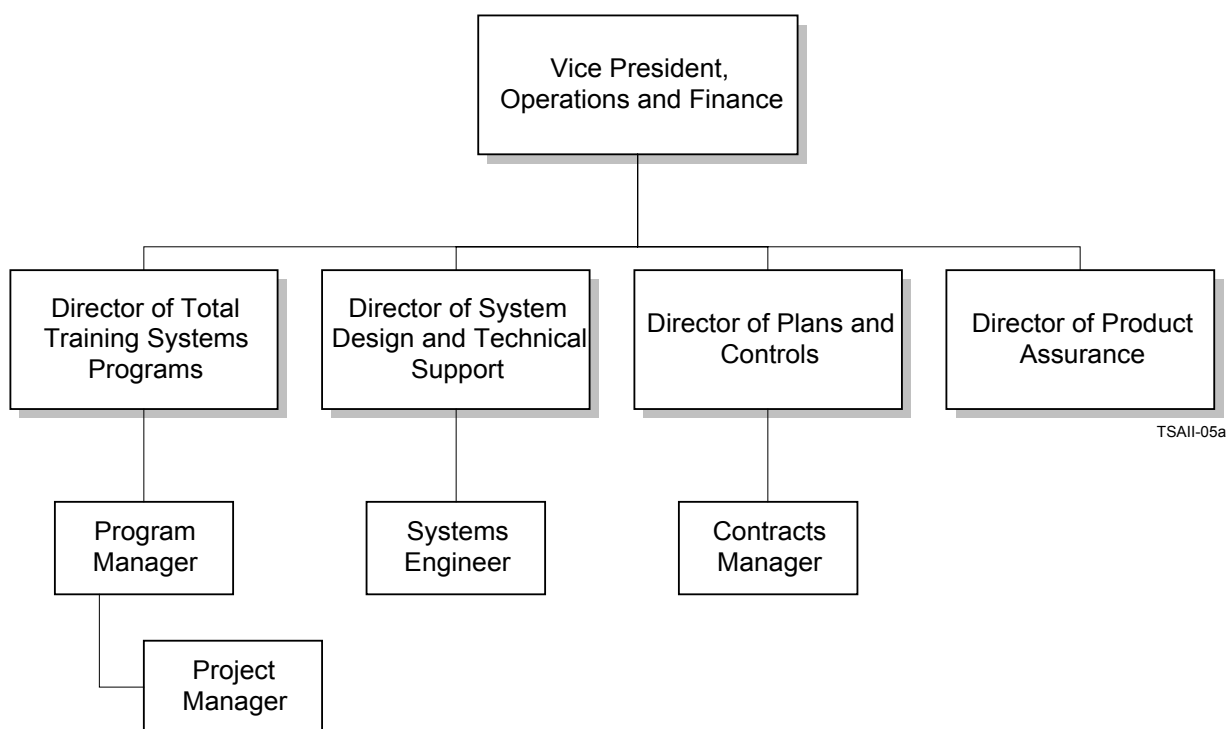


Figure 2.1-1 Organizational Chart

2.2 MAKE/BUY DECISION

FlightSafety has a “sister” division (FlightSafety International - Simulation Systems Division (SSD)) that is the most prolific manufacturer of FAA certified flight simulators in the world. Because they possess the resources and experience required to accomplish any ATS device modification, FlightSafety will perform a make/buy analysis fully compliant with FAR 15.407-2 prior to commencing any subcontracting action. If the decision is to “make”, SSD will be issued an Interdivisional Work Authorization (IWA) and management of the IWA will be accomplished identically with the process described herein for subcontractors; including the formation and implementation of an IPT.

2.3 SELECTION

If the decision is to “buy”, FlightSafety will normally subcontract with one of the teaming members for TSA II (see Paragraph 5.2 below). For subcontracted requirements that cannot be accomplished by one of the teaming partners, FlightSafety will search for the best subcontractor to accomplish required effort. Emphasis will be placed on finding small disadvantaged and minority owned



businesses. Potential subcontractors will be pre-qualified by investigating their capabilities and past performance. When a subcontracted effort is identified, a Request for Quotation that includes a detailed Statement of Work and Technical Specifications allocating system requirements to the subcontractor will be distributed to potential subcontractors. The SOW will include a Subcontract Data Requirements List (SDRL) that is a tool used to flow down Government requirements and to provide visibility into the subcontractor's designs, plans, and status, and to provide deliverable project documents.

When bids are received, the Systems Engineer will do a technical evaluation in accordance with (IAW) the SDTS Estimating SOPP for Technical Evaluation of Proposals. This SOPP prescribes a point-by-point comparison of the requirements as stated in the subcontract RFP with the technical details proposed by the offerors, including the proposed schedule. The results of this comparison are then multiplied by the pre-determined weighting factor for each requirement and a resultant numerical score given to each technical proposal. While this is going on, the Contracts Department will perform a business evaluation to assess the likelihood that the offeror will, in fact, perform as proposed. This evaluation includes reviewing a Dunn and Bradstreet report of the prospective subcontractor, and reviewing the subcontractor's performance history and capabilities statement. The Contracts Department will also perform a cost analysis for the proposals IAW the Contract Administration Subcontracting Policy. The results of the technical evaluation will then be weighed against the results of the business evaluation and the proposed price to identify the best value low risk offeror. Any sole source or single source procurement must be fully justified in writing.

2.4 ADMINISTRATION

2.4.1 Oversight

Active oversight of the subcontractor is essential to the successful completion of any subcontract. The IPD concept not only facilitates but mandates active oversight. FlightSafety will impose contractual provisions in all subcontracts (including Inter-divisional Work Requests with SSD) to enable the necessary level of oversight. The most important provision in all major subcontracts will be the establishment of the IPD concept and a subcontract IPT that can call IPT meetings at any time on short notice to address and resolve potential problems before they become problems. Other subcontractual



provisions for enabling active oversight may include, but not necessarily be limited to:

- Detailed Project Schedule
- Monthly Progress Reports
- System Requirements Review (SRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR) (may be combined with the PDR for simple modifications)
- In Process Reviews (IPRs) (may be omitted if in-plant portion of project is 4 months long or less)
- In-Plant Testing (may be omitted if modification must be integrated with on-site training device before it can be tested)
- Functional Configuration Audit (FCA)/On-Site Acceptance Testing
- Physical Configuration Audit (PCA)

These reviews will be IPT events. The reviews and audits will be scheduled and accomplished IAW applicable provisions of MIL-STD-1521B. Testing will be done IAW a subcontractor developed FlightSafety approved Acceptance Test Procedure. The detailed project schedule will be prepared by the subcontractor and reviewed and approved by FlightSafety. This schedule will be a major agenda item at the SRR.

2.4.2 Control

Upon execution of a subcontract or Interdivisional Work Authorization FlightSafety Contracts Department, IAW the requirements of the Subcontracting Manual, will establish a listing of suspenses for all subcontract deliverables. This list, along with the reports and reviews discussed in paragraph 2.4.1, will be used to assist in the on-going evaluation of the likelihood of the subcontractor fulfilling the contract as promised.

FlightSafety will use the reviews and reports described in paragraph 2.4.1 to detect any technical, schedule, or quality problems at a very early stage. When problems are detected FlightSafety will convene an IPT meeting to analyze the problem, discuss alternatives, and identify and implement a recovery plan. In the event work-arounds and recovery plans are not satisfactorily effective,



FlightSafety will use one or more of the following recourses available to minimize and mitigate the impact of a problem: provide FlightSafety technical support personnel to help the subcontractor, withhold progress payments, issue "Show Cause" and "Cure" notices, and finally termination for cause.

2.5 INTEGRATION

2.5.1 Management Team Integration

FlightSafety will be ultimately responsible for the successful completion of all tasks directed under a TSA II task order, and FlightSafety, FlightSafety's subcontractors, and the Government will work together in an IPT environment to define and refine requirements; prioritize and schedule tasks and events; review and approve designs; identify and mitigate problems; and test and accept the modification. FlightSafety will enable the IPT concept by requiring it in the subcontract Statement of Work and Specifications. The subcontract IPT will be set up at the SRR.

2.5.2 Product Integration

All modifications will be developed and tested as applicable in the subcontractor's facility. Integration into the ATS will take place at the prototype development site. Integration of complex modifications into the existing hardware and software will be facilitated by generation of an Interface Control Document (ICD). The ICD will identify all the physical, functional, and protocol characteristics of the hardware, electrical, and computer interfaces between the modification and the existing hardware and software. FlightSafety will provide the subcontractor all the library data on the existing hardware and software. The ICD will be written by the subcontractor and reviewed and approved by FlightSafety. The ICD will be an agenda item at the PDR and CDR.

3.0 QUALITY ASSURANCE

3.1 NEW OR PENDING SUBCONTRACT QUALITY REQUIREMENTS ANALYSIS

The first step in the Quality Planning function is to evaluate the potential subcontract from the standpoint of the impact the new business will have on Product Assurance functions. This analysis will be conducted in a structured method outlined in QAM-1000. All quality requirements contained in the prime contract and any new requirements documented as a result of the requirements analysis will be



flowed down to the subcontractor via contractual documents.

3.2 QUALITY SURVEY OF CANDIDATE SUPPLIER/SUBCONTRACTOR

Upon request from FlightSafety Project Management, Product Assurance will conduct a quality evaluation of a potential subcontractor. This evaluation will be requested when a candidate subcontractor who has not established a quality history with FSSC is being considered for new business. This survey will gather information relative to the candidate subcontractors' capability to conform to contract quality requirements. This is one of the factors that may be considered during FSSC's selection process. Procedures for conducting this survey are found in QAM-1000, procedure number Q-3515.

3.3 VERIFICATION MATRIX

All FSSC subcontracts that are competed will include a requirement for a verification matrix as a part of every bidder's submission. The verification matrix format will be prescribed by FSSC and will require the bidder to determine how each paragraph in the technical specification will be tested to ensure requirements are met.

3.4 PRELIMINARY DESIGN REVIEW (PDR)

Product Assurance will be represented at the subcontractor PDR. Information presented at PDR by the subcontractor will be evaluated against the contract requirements by Product Assurance to ensure that the proposed design meets all quality requirements. In the case of most simulator modifications, Federal Aviation Advisory Circular 120-40B requirements are considered. Any quality related action items generated at PDR will be monitored by Product Assurance.

3.5 CRITICAL DESIGN REVIEW (CDR)

One of the products presented by the subcontractor at PDR will be a draft of the Acceptance Test Procedures (ATPs) to be used to verify compliance of the subcontracted effort with the contractual requirements. Product Assurance and Engineering will ensure that the draft ATP satisfies the verification matrix in the subcontract, is of appropriate detail and depth, and meets the format and flow requirements of the existing ATPs. In conjunction with the CDR a Test Planning Working Group (TPWG) will be convened. The TPWG will consist of, at a minimum, representatives of all organizations who will participate during in plant and on-site acceptance testing. The TPWG will



determine test schedules, test protocols, team makeup, specific test assignments, and other details of testing associated with the project undergoing PDR.

3.6 TEST READINESS REVIEW (TRR)

Prior to any test activity a TRR will be conducted. The TRR will at a minimum consist of a review of the readiness of the product to be tested. All required documentation will be reviewed to ensure that the product is ready to begin test. Testing will not begin until the Product Assurance representative is assured that the product and all assets required for testing are available.

3.7 IN-PLANT TESTING

For major modifications to training devices Product Assurance conducts in plant acceptance testing. In most cases the ATP which will be used for final on-site testing will be employed. Deficiency reports will be generated during in plant acceptance and will be resolved prior to final on-site acceptance.

3.8 ON-SITE TESTING

On-site testing will be the final acceptance testing for any product or modification delivered by a subcontractor. The ATP, as approved, will be used to verify the as built product satisfies the contract requirements. Problems or deficiencies will be annotated on Discrepancy Reports (DRs) as per the requirements of individual Quality Assurance Program Plans (QAPPs). Unresolved DRs will be listed on the final acceptance certificate. DRs that precluded intended use or identify serious maintainability issues must be resolved prior to final acceptance.

3.9 DISCREPANCY REPORT PROCESS/PROCEDURES

FlightSafety documents deficiencies discovered during FSSC test activities on a FlightSafety Deficiency Report and tracks them on a DR database.

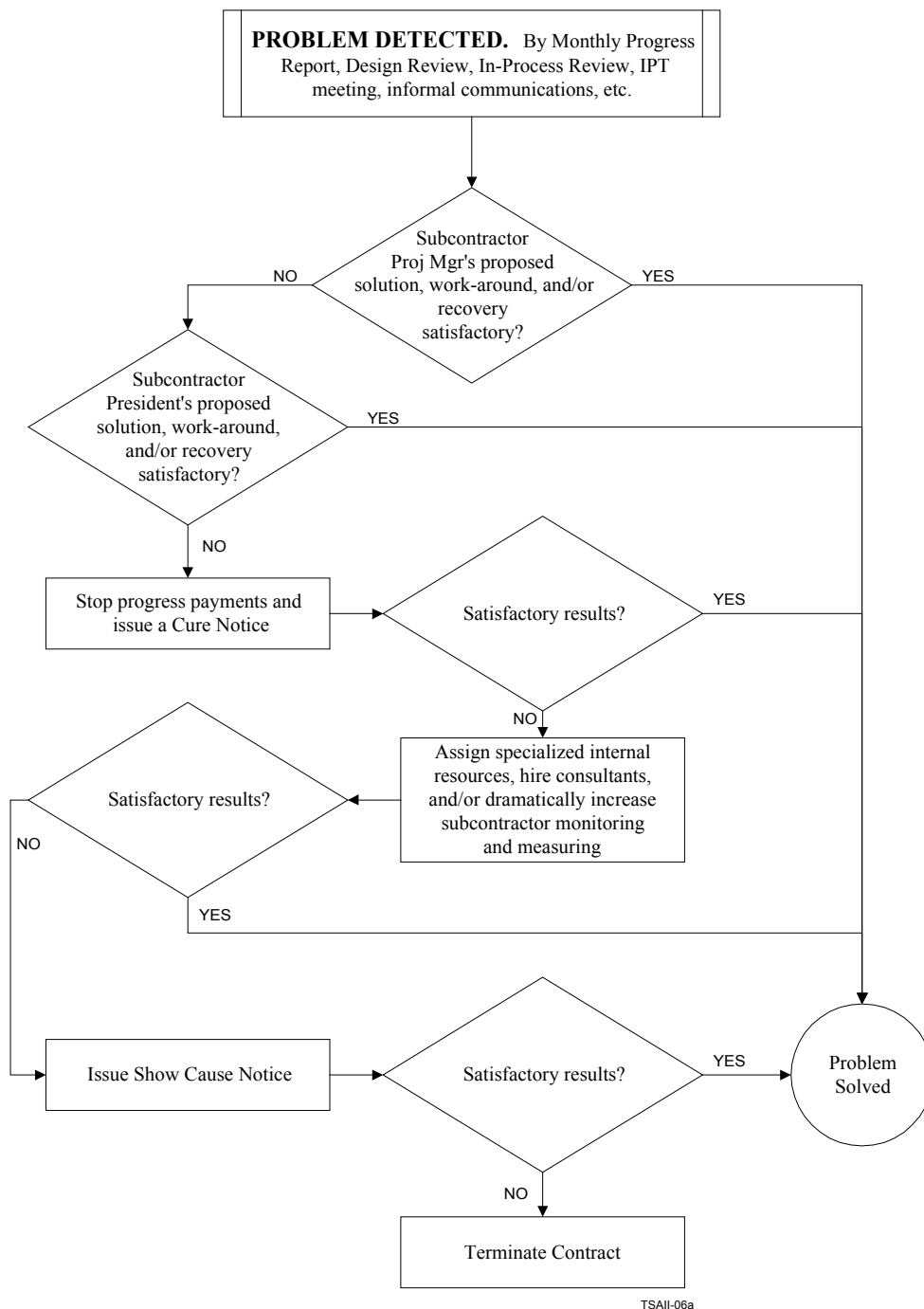
4.0 PROBLEM RESOLUTION PROCESS

Should problems arise in the performance of subcontracted requirements despite FlightSafety's commitment to high visibility and to the IPT process, FlightSafety has a number of options available to pre-empt, counteract, correct, and/or work-around any such possible problem.

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Because of FlightSafety's processes to enhance visibility into the subcontractor's schedule and technical development status, potential problems will be detected and identified while they are still only potential problems. Any and every occurrence of an event and/or activity which is falling behind schedule will require discussion with the subcontractor Project Manager to identify the cause, impact on the rest of the project, and what the planned work-around/catch-up plans are. If these discussions are unsatisfactory, FlightSafety will elevate the problem to the highest level of the subcontractor management organization. If the discussions still aren't satisfactory, FlightSafety will immediately stop progress payments and issue a "cure" notice. The next step, if still unsatisfactory, will be to hire expertise from our established consultant/subcontractor pool to "augment" the subcontractors technical and/or management staff. If these steps still prove to be ineffective, FlightSafety will issue a "show cause" notice followed quickly by terminating the subcontract and awarding completion to another subcontractor, or completing it with FlightSafety resources. The subcontract problem resolution decision tree is illustrated in Figure 4.0-1, shown on the following page.



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Figure 4.0-1 Problem Resolution Decision Tree



5.0 SUBCONTRACTORS

The principal potential and on-contract subcontractors for the TSA II program, along with their specific areas of expertise as they relate to the TSA II program, are identified below. Subcontractors will be selected from those identified if possible however, other subcontractors may be sought and engaged if capabilities are required which are not readily available within this identified pool.

5.1 PROPOSED SUBCONTRACTORS

For all TSA II Task Order requirements that are determined to be a "Buy" vs a "Make," FlightSafety will assign work to our TSA II teaming partners (see paragraph 5.2) in accordance with the terms of the work split clause of our respective teaming agreements. The capabilities of these teaming partners are identified in Table 5.1-1. For all other TSA II requirements, FlightSafety will seek bids from the many subcontractors with whom we have had successful dealings on other programs.

Table 5.1-1 Teaming Partners

Team Member	Capabilities
FlightSafety Simulation Systems Division (SSD)	<p>Located in Broken Arrow Oklahoma, SSD's plant spans 243,000 square feet of floor space including 67,000 feet of high bay area and 42,300 feet of engineering and administrative office space. In recent years, SSD has produced high quality, modern flight simulators intended for military use, including the C-17 WSTs, the V-22 Osprey tiltrotor simulators, and the JPATS family of Training Devices.</p> <p>To date, SSD has produced over 215 flight simulators, of which 116 are FAA level C certified and over 50 are FAA Level D certified. Supporting an ever-increasing production rate of up to 20 full 6 DOF motion and "wide" visual equipped flight simulators per year, SSD has been instrumental in achieving the predominant role FSI now holds in aircrew training. In fact, FSI now owns more flight simulators than any other company in the world, and owns/operates 43% of FAA Level C/D certified simulators.</p>
Teledyne Brown Engineering	<p>Teledyne Brown Engineering (TBE), As leading technology solutions provider, TBE is making significant contributions in America's most important defense, space, information, environmental, and energy efforts. TBE is the US Army's largest missile defense Systems Engineering and Technical Assistance (SETA) contractor, TBE provides advanced information solutions at the cutting edge of technology, specializing in analysis studies; training systems design and development; modeling, simulation and analysis; custom training; e-business; and IT consulting solutions.</p>



Sytronics	Sytronics, Inc. is a small business headquartered in Dayton Ohio and doing business in Modeling, Simulation and Training, Human Systems Engineering, and Test Systems production for government and commercial customers throughout the United States. Sytronics currently employ a professional staff of more than 100 scientists and engineers who are experienced in applying advanced technology solutions to a variety of customer requirements.
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5.2 SIGNED TSA II SUBCONTRACT AGREEMENTS IN EFFECT

The following subcontractors have signed teaming agreements with FlightSafety for TSA II Task Orders:

- Teledyne Brown Engineering
- Sytronics

6.0 INTER-COMPANY

When the Make/Buy analysis (ref paragraph 2.2) indicates a particular product or service should be produced or performed by our Simulation Systems Division (SSD) or our Visual Simulation Systems (VSS) division vs being purchased from outside the company, FlightSafety (Services Corp) will issue them an Interdivisional Work Authorization (IWA). The IWA will include the same specification, SOW, and visibility/reporting/control provisions normally included in a third party subcontract. The same System Engineering/Project Management practices described elsewhere in this document for third party subcontractors will be followed, including design reviews, acceptance testing, monthly reports, site visits, etc. In addition to all the problem resolution processes described in section 4.0 for subcontractors, we have the additional problem resolution alternative available for "sister" divisions of appealing to a common boss.

7.0 EXAMPLES OF RECENT SUCCESSFUL SUBCONTRACTOR/VENDOR MANAGEMENT

FlightSafety frequently purchases products and services from third party subcontractors and vendors. We currently have over a half dozen on-going major subcontracts; all of which are successful. These subcontracts are discussed in the following section.



7.1 CAE

We are currently nearing completion of a subcontract with CAE Electronics of Montreal Canada for two new C-5 flight simulators. Because CAE built the first 7 C-5 simulators under a subcontract to FlightSafety several years ago, they were selected to build numbers 8 and 9. Both simulators have successfully completed in-plant acceptance testing and have been delivered to site. FlightSafety is managing this subcontract to an on-time delivery. All technical and cost objectives are being met.

One example of a problem encountered and solved is precipitated by the fact the airplane has been out of production for over 15 years, which meant many aircraft parts were no longer available. FlightSafety, after researching and exhausting possible government sources for these parts, was successful in locating sufficient data to enable the subcontractor to manufacture simulated parts. The Attitude Direction Indicators (ADIs) is an excellent example of this. Not only were ADIs no longer available for purchase, the entire Air Force inventory of ADIs was rapidly becoming unsupportable. FlightSafety searched the market and found a simulated hybrid solution incorporating a glass 2-dimensional simulation of the horizon ball and actual hardware for the remainder of the instrument. Air Force acceptance of this solution was so enthusiastic that they are currently looking at this concept for use in the actual C-5 airplanes. This subcontract will be completed on time in April, 2001.

7.2 HURIEGA DEVELOPMENT SYSTEMS (HDS)

We are also nearing completion of a major subcontract to design and build a simulator enclosure on site at Kelly AFB to house one of these new simulators. HDS is a small minority owned company. This enclosure, inside an existing hangar, includes the simulator bay, computer room, HPU room, maintenance shop, maintenance manager's office, and 4 briefing rooms. The simulator has been installed in the enclosure and only minor finish-up remains. All cost, schedule, and technical objectives have been met.

One problem encountered and solved on time was the marginal ceiling height of the hangar. The solution FlightSafety facilitated was to put the ceiling of the simulator high bay ABOVE the bottom of the existing trusses of the hangar. This subcontract will be completed a little behind original schedule, but still prior to the need date.



7.6 LOGICON

FlightSafety subcontracted with Logicon to design and build the Training Integrated Management System (TIMS) for the Air Force and Navy primary flying training bases. It is a highly complex system requirement, compounded by need to satisfy two very different training environments, is spread out over twelve AF and USN bases, and must accommodate almost 90 different courses.

One of the significant problems encountered during development was that the software-scheduling engine selected for TIMS (NASA Rose) turned out to be inadequate for the level of schedule complexity required for the contract. FlightSafety worked with Logicon to a) perform an analysis verifying the initial findings; b) survey the commercial market for suitable replacement scheduling engine candidates; c) brief and educate the customers to understand the implications of the problem and reasonable alternatives; and d) assist Logicon in developing an in-house scheduling engine that satisfies requirements.

Another problem encountered on this subcontract centered on recruiting and retaining the skilled software engineers and programmers Logicon needed in the highly competitive high tech marketplace between 1999–2000. Logicon was losing key personnel to companies offering wages and benefits impossible to match on a government contract, placing the TIMS development schedule in jeopardy. FlightSafety used contacts overseas to arrange for eight highly skilled programmers from Britain to augment the Logicon workforce, and installed a bonus/retention program for Logicon to retain its key workers. FlightSafety has assisted Logicon to almost double the workforce in critical areas to accommodate customer design changes and adhere to program schedule. This subcontract is scheduled for completion on time, on 28 Feb, 02.